

WHAT IS CLAIMED IS:

1. A formulation comprising a therapeutically effective amount of growth hormone in an aqueous solution, a buffer that maintains the pH of the formulation at a pH of about 5 to about 7, a non-ionic surfactant, a polymer stabilizer, and optionally further comprising one or more excipient selected from the group consisting of: a divalent cation present in a magnesium salt selected from the group consisting of magnesium hydroxide, magnesium chloride, magnesium sulfate, magnesium citrate, and magnesium edetate; a tonicity agent; methionine; and a preservative, wherein the formulation remains stable after at least one freezing and subsequent thawing event.
2. The formulation of claim 1, wherein the human growth hormone is a recombinant form of human growth hormone.
3. The formulation of claim 2, wherein the growth hormone is present in the formulation at a concentration of about 0.1 mg/ml to about 20 mg/ml.
4. The formulation of claim 1, wherein the buffer is selected from the group consisting of sodium citrate, sodium edetate, sodium succinate, and histidine hydrochloride.
5. The formulation of claim 1, wherein the non-ionic surfactant is present at a concentration of about 0.02 % to about 10 %.
6. The formulation of claim 1, wherein the non-ionic surfactant is a polysorbate selected from the group consisting of polysorbate 20 and polysorbate 80.
7. The formulation of claim 1, wherein the polymer stabilizer is present at a concentration of about 0.001 % to about 70 %.
8. The formulation of claim 1, wherein the polymer stabilizer is poly(ethylene) glycol having a molecular weight in the range of about 3000 to about 20,000.
9. The formulation of claim 1, wherein the tonicity agent is sorbitol.
10. The formulation of claim 1, wherein the preservative is selected from the group consisting of phenol and benzyl alcohol.
11. A formulation comprising, about 0.1 mg/ml to about 20 mg/ml of a recombinant form of human growth hormone in an aqueous solution, a citrate or edetate buffer that maintains the formulation at a pH of about 5 to about 7, about 0.04% to about 5% (w/w) of a

polysorbate surfactant, about 0.001% to about 20% (w/v) of polyethylene glycol, and optionally further comprising one or more excipient selected from the group consisting of; a sufficient concentration of sorbitol for the formulation to be approximately isotonic, methionine, magnesium chloride or magnesium hydroxide, a preservative wherein the formulation remains stable after at least one freeze thaw event.

12. The formulation of claim 11, wherein the preservative is phenol or benzyl alcohol.

13. The formulation of claim 11, wherein at least about 90% of hGH remains in solution after exposure of the formulation to three or more freeze-thaw events.

14. The formulation of claim 11 where the formulation is stable at about 2°C to about 8°C for at least 52 weeks.

15. The formulation of claim 14 wherein after storage for 12 months at about 2°C to about 8°C total aggregate as measured by size exclusion HPLC is less than about 0.5%, and/or total deamidation as measured by anion exchange HPLC is less than about 7%, and/or hGH recovery as measured by reverse phase HPLC is greater than or equal to 85%.